The subject is one that is beset with peculiar difficulties, and one in which extreme caution is necessary in drawing anything like definite conclusions. But it is one that is throwing, and is likely to throw, important side light on normal psychology, and one that may prove helpful in elucidating the difficult problem of the nature of the association of brain and consciousness. It will only be possible in the space at our disposal to indicate the nature of some of the evidence M. Binet adduces, and the interpretation suggested by this learned and lucid writer.

The phenomena of so-called spontaneous somnambulism are somewhat as follows. The patient is, we will say, a dull and melancholy young woman. She falls into a deep and prolonged sleep, or suffers from an hysterical or convulsive crisis. On waking from the sleep, or emerging from the crisis, she is in an altered condition, with little or no memory of her previous life, and no apparent knowledge of her friends and relations. Her character is changed: no longer dull and melancholy, she is bright and merry. In this state she remains for a time, learning anew the ways of the world, and daily profiting by her fresh experiences. Then she falls again into deep slumber, or other crisis, from which she emerges her old self once more, taking up her normal dull and melancholy life just where she left it. She remembers nothing that happened in her abnormal or second state. There is no continuity between the two. Such alterations of personality may continue at varying intervals for many years.

Somewhat similar are the phenomena observed in the somnambulism induced through hypnotic suggestion. M. Janet's subject, Léonie, is a serious and rather sad person, calm and slow, very mild with everyone, and extremely timid. Hypnotized, she becomes a different being. She keeps her eyes closed, but her other senses are abnormally acute. She is gay, noisy, and restless; good-natured, but with a tendency to irony and sharp jesting. In this condition she repudiates her former self. "That good woman is not myself," she says, "she is too stupid!"

M. Binet, summarizing the principal modifications of memory in hypnotic somnambulism, says that the subject, during the normal condition, remembers nothing of the events which have taken place during somnambulism, but that, when hypnotized, he may remember not only the occurrences in former somnambulisms, but also those which belong to the normal state. There is thus some continuity of the normal into the hypnotic personality, but none from the hypnotic to the normal. "Le livre de la vie somnambulique se ferme au réveil, et la personne normale ne peut pas le lire."

But though there is no conscious memory in the waking state of what has occurred during somnambulism, it is said to be possible to unseal the register thereof through automatic writing. A fact is told to the subject in the state of somnambulism under hypnosis, and the subject is then restored to the normal state. He has no recollection of the fact, and knows nothing about it. But slip a pencil between his fingers, hiding the hand from his eyes by means of a screen, and he will write down the fact automatically (Gurney).

In cases of so-called "negative hallucination" or "systematic anæsthesia," the subject under hypnotic suggestion neglects and is apparently blind to certain objects. For example, two out of a number of blank cards are marked with a cross, and the subject is made blind to these. If she be given a dozen cards, and among them these two, and if she be asked to count the cards, she will neglect these two and reply that there are ten. But if a pencil be slipped between her fingers, and she be asked in a low voice how many cards there are, she will reply, in automatic writing, *two*. And if she be asked, in the same tone, why she said ten and neglected these two, she will write in reply that "she could not see them."

On the basis of such observations as are here briefly summarized, and others for a description of which we must refer our readers to the book itself, M. Binet contends that, associated with the same physical individual, there may be two (or more) personalities, both of which are conscious. They may be co-existent or successive. Anæsthesia is the barrier which separates co-existent personalities: amnesia the barrier which separates successive personalities. "En un mot, il peut y avoir chez un même individu, pluralité de mémoires, pluralité de consciences, pluralité de personnalités; et chacune de ces mémoires, de ces consciences, de ces personnalités ne connaît que ce qui se passe sur son territoire." We do not propose to discuss this position. Suffice it to say, that for ourselves we see no satisfactory evidence of the *co-existence* of two personalities *both of which are simultaneously conscious*. Strange alterations and modifications of personality may occur under peculiar circumstances; but this is something very different from the supposed co-existence of two or more distinct consciousnesses.

C. LL. M.

OUR BOOK SHELF.

Volcanoes: Past and Present. By Edward Hull, M.A., LL.D., F.R.S. With Forty-one Illustrations and Four Plates of Rock-sections. (London: Walter Scott, 1892.)

IN this new volume of the "Contemporary Science Series," Prof. Hull has given a very readable account of the phenomena of volcanoes and earthquakes. A short introduction to the subject of vulcanology is followed by a sketch of the active and extinct volcanoes of Europe, and this by an account of some of the "dormant or moribund volcanoes of other parts of the world." From this description of recent volcanoes, the author proceeds to the consideration of the Tertiary volcanic districts of the British Islands, and the pre-Tertiary volcanic rocks of our own and other countries. The two concluding chapters of the book are devoted to a consideration of the remarkable eruption of Krakatão in 1883, and the great earthquakes which during the last few years have attracted so much attention, with a discussion of some of the volcanic and seismic problems suggested to the author by his review of the phenomena. These problems are classed by the author under the following heads:—"The Ultimate Cause of Volcanic Action," "Lunar Volcanoes," and the question: "Are we living in an Epoch of special Volcanic Activity?" An appendix gives "A Brief Account of the Principal Varieties of Volcanic Rocks."

In a little book of 270 pages it has of course been impossible for the author to do full justice to such a wide circle of topics, and it is sometimes difficult to detect the principle on which certain subjects have been included, and others rejected by him. But the author may be fairly credited with having accomplished his main object, which he has defined as follows: "To illustrate the most

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recent conclusions regarding the phenomena and origin of volcanic action by the selection of examples drawn from districts where these phenomena have been most carefully observed and recorded under the light of modern geological science."

An admirable feature of the work is the recognition of the principle that vulcanological problems may often be better attacked by the study of ancient and greatly denuded volcanoes, rather than by the examination of those in actual activity, or of such as have recently become extinct.

"*Encyclopédie scientifique des Aide-mémoire*":—
Résistance des matériaux. Par M. Duquesnay.
Étude expérimentale calorimétrique de la machine à vapeur. Par V. Dwelshauvers-Dery.
Air comprimé ou raréfié. Par Al. Gouilly.
(Paris: Gauthier-Villars, Georges Masson.)

THESE three little hand-books on their respective subjects are made by the separate publication of the respective articles of the "Encyclopédie scientifique"; it is intended that each subject is to appear in a separate volume at a rate of publication of thirty to forty a year.

There is no indication by numbering as to the order of appearance, so that probably these are the pioneer volumes.

The first volume, "La résistance des matériaux," gives a very clear and concise account of the practical side of Elasticity, so far as required by the engineer in the design of beams, columns, bridges, and retaining walls.

Prof. Dwelshauvers-Dery is well known for his theoretical and experimental researches on the Steam Engine, and his treatise may be considered as the application of the empirical laws of saturated vapours to the theoretical determination of the useful effect obtainable in the different forms of steam engine, simple or compound, with an attempt at the evaluation of the loss due to conduction. The results arrived at are checked by comparison with long-continued steam-engine trials carried out by Hirn, Donkin, Longridge, and the author himself.

The third volume, on "Air comprimé," may be supposed to carry out the same development of abstract Thermodynamics when the medium is supposed to behave as a perfect gas. In this case the mathematical laws, developed at the outset, are capable of more ready and immediate application; and the second half of the book gives a detailed account of the employment of air as the medium for the transmission of energy in its various industrial applications—for instance, as laid on in Paris compressed in mains, or as employed when rarefied in the Westinghouse brake.

A useful feature in these books is a page at the outset, in which the notation to be subsequently employed is carefully explained.

The Mechanical Equivalent of Heat is taken as 425 kilogrammetres, presumably at Paris; the mean of Prof. Rowland's experiments gives about 427 Baltimore kilogrammetres, or in absolute measure about 42 million ergs, or 4·2 joules.

The "Encyclopédie" is to be divided in interest between the *section de l'Ingénieur* and the *section du Biologiste*; the volumes promised in the first section, as in course of preparation, will constitute a valuable technical working library. G.

Chambers's Encyclopædia. New Edition. Vol. IX. (London and Edinburgh: W. and R. Chambers, 1892.)

THE new edition of this admirable Encyclopædia is now approaching completion, and in the present volume there is certainly no falling-off in the ability with which the work has hitherto been written and edited. On all important subjects represented by words between "Round" and "Swansea" there are articles summing up the latest results of research. An excellent article on round towers, by Dr. Joseph Anderson, is given on the first and second pages. This is a model of what such a paper ought to be. The author knows his subject thoroughly, and consequently understands where to draw the line between ascertained facts and the theories based upon them. Another well-arranged archæological contribution by Dr. Anderson is the paper on sculptured stones. Dr. John Murray writes with his usual lucidity on the sea and on sounding. The task of expounding the facts and laws relating to sound and to the spectrum has been intrusted to Prof. Knott, and the Rev. E. B. Kirk contributes the articles on the sun and the stars. Dr. Buchan is the author of a clear and interesting paper on storms. Other scientific articles which may be specially noted are those on the Silurian system, by Prof. James Geikie; on the skull, by Dr. D. Hepburn; on the snail and the slug, by Mr. T. D. A. Cockerell; on snakes and spiders, by Mr. J. A. Thomson; on the steam-engine, by Prof. A. B. W. Kennedy; and on the steam-hammer, by Prof. T. H. Beare. Among the geographical contributions are articles on Russia, by Prince Kropotkin; on Siam, by Mr. J. S. Black; on South Australia, by Mr. J. Bonwick; and on Spain, by the Rev. Wentworth Webster.

A Guide to Electric Lighting. By S. R. Bottone. (Whittaker and Co., London, 1892).

IN this work the author gives a general idea of the various methods of electric lighting, without entering into any of those technicalities which tend to confuse rather than enlighten the ordinary reader. Commencing with descriptions of the various batteries that are now employed, he discusses their particular advantages and disadvantages, adding also a table of their E.M.F., currents, and resistances.

The second chapter, which is devoted to the production of currents by means of the dynamo, will enable the reader to form some idea as to the selection of one of these machines for a given purpose, and to understand its general principles. Perhaps the chapter on electric lamps and accumulators will be found the most serviceable, for one is brought far more into contact with them than with dynamos themselves. The information here will enable anyone to set up a small installation for himself, while a very useful table shows the dimensions, capacities, weights, &c., of accumulators suitable for such work.

The remaining chapters deal with the descriptions of some of the smaller appliances necessary in connecting up the supplier of electricity, whether it be dynamo or accumulator, with motors or transformers, and last but not least with an excellent *résumé* of the cost of maintenance, showing the relative prices of gas and electricity as now regulated.

The book contains numerous illustrations, and as a thoroughly practical and handy work should be widely read.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

"The Grammar of Science."

To the vast majority of readers, chapter ix. of the "Grammar of Science" will probably seem to be simply a plea in favour of the doctrine of evolution in its purest form. We were not called upon to express any opinion as to the merits of this doctrine, nor did we. What struck us (and still strikes us) as fundamentally illogical, was the formulation of a theory, which, itself avowedly a mental product, proceeded to picture a universe devoid of sentient beings, or, in the phraseology of the "Grammar," a

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